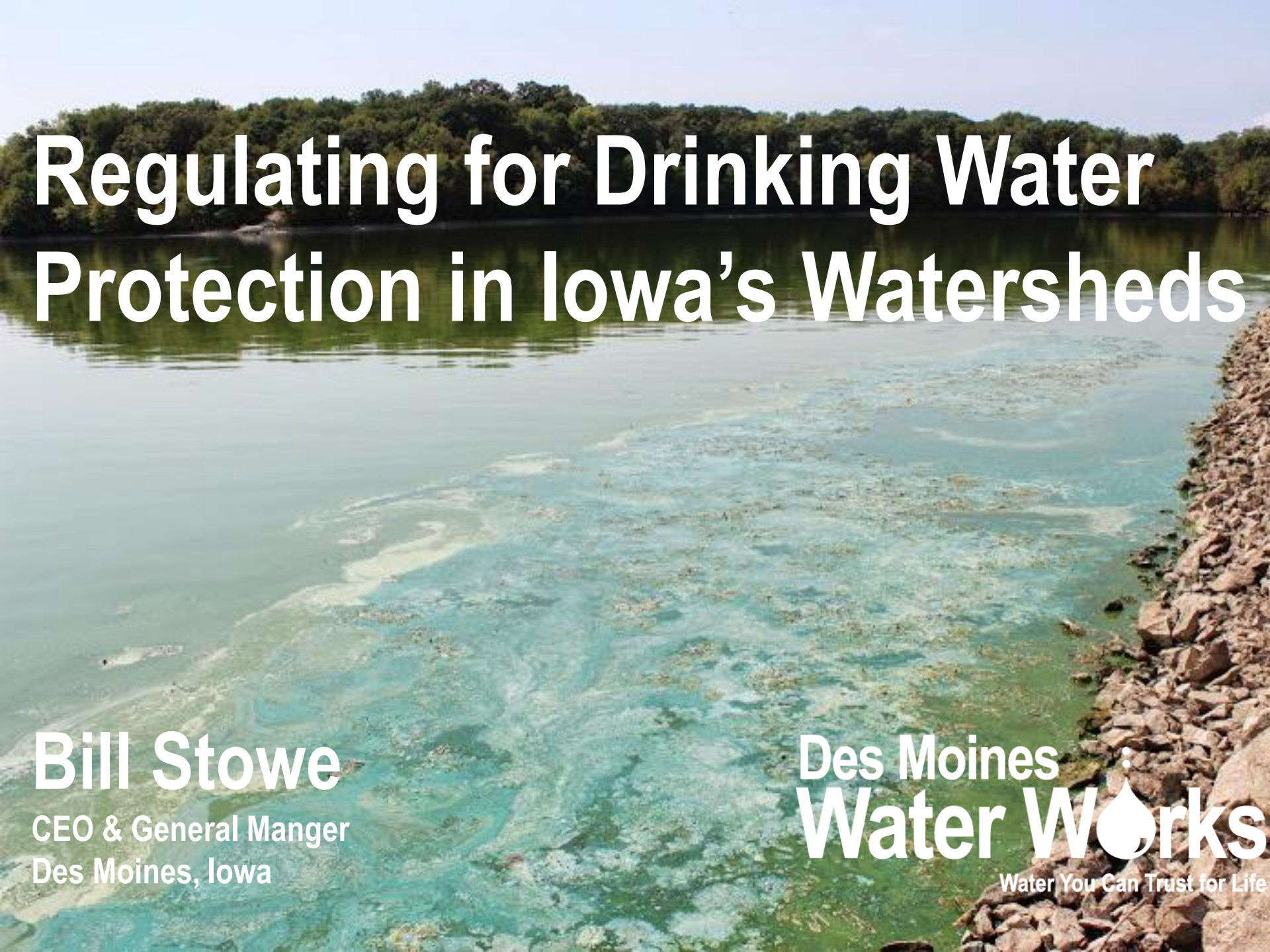


Regulating for Drinking Water Protection in Iowa's Watersheds

Bill Stowe

CEO & General Manger

Des Moines, Iowa

Des Moines Water Works

Water You Can Trust for Life

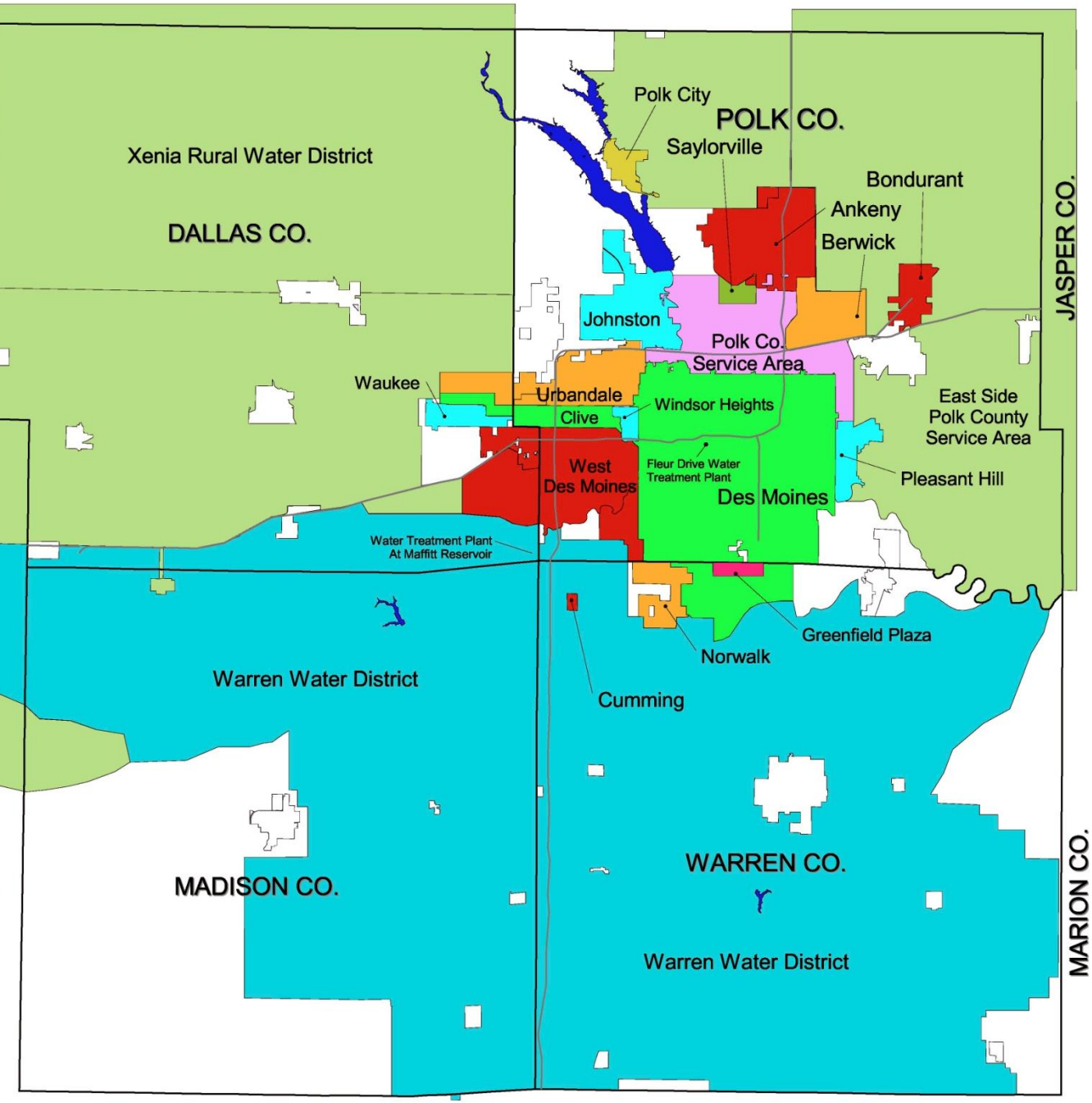
Water in the News

The Blue Planet

- Earth's surface is approximately 75% water
- 97% of Earth's water is salt water
- 80% of fresh water is in ice
- The human body is 70% water
- Humans are nearly 100% water at conception
- Available potable water is shrinking

Des Moines Lobe: Raccoon River & Des Moines River Watersheds

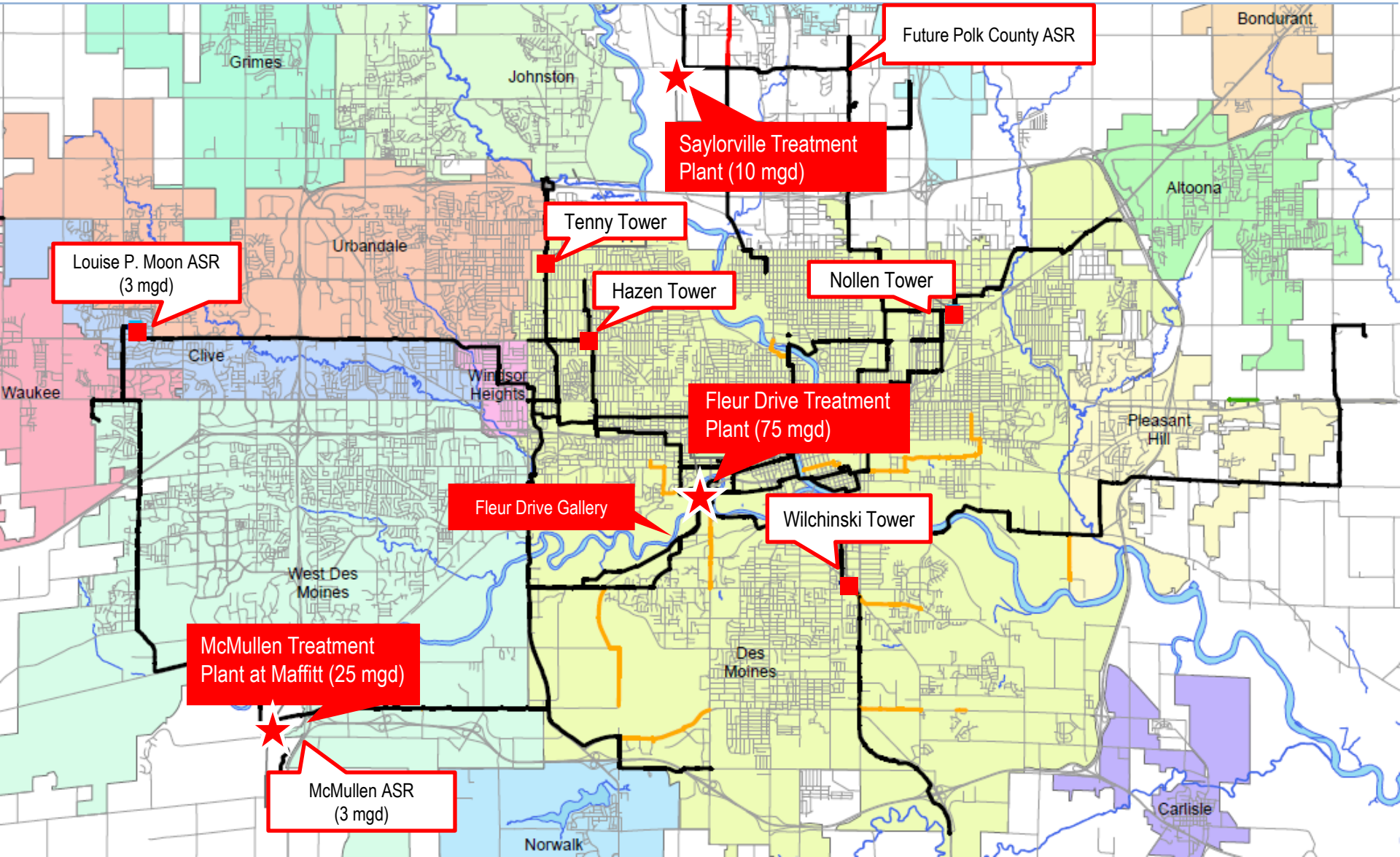
DMWW Service Area



- Urban
- Suburban
- Rural

DMWW Treatment Plants & Distribution System

3 treatment plants
2 ASR wells
1 infiltration gallery
1,360 miles of pipe



Safe Drinking Water Act Laboratory Testing

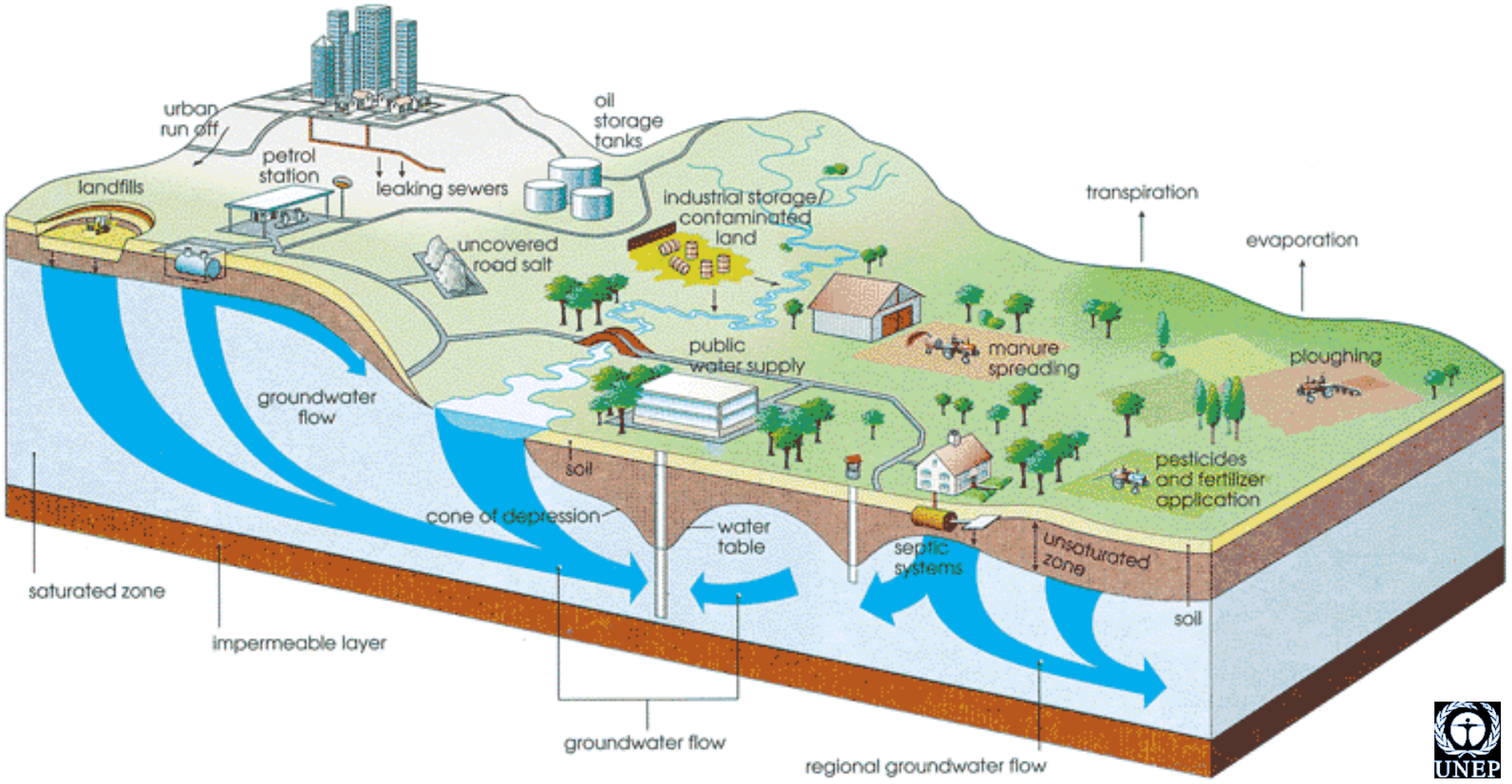
- **60,000** analyses conducted by DMWW for annual water production, at a retail cost of **$650,000**.

- There are also a number of unregulated contaminants that are voluntarily monitored to ensure the safety of our customers, i.e. Cyanobacteria and algal toxins.

Microorganisms	7
Disinfectants	3
Disinfection Byproducts	4
Inorganic Chemicals	16
Organic Chemicals	53
Radionuclides	4
TOTAL	**87***

**30 related to agriculture*

The Hydrologic Cycle




CITIZEN
KANE

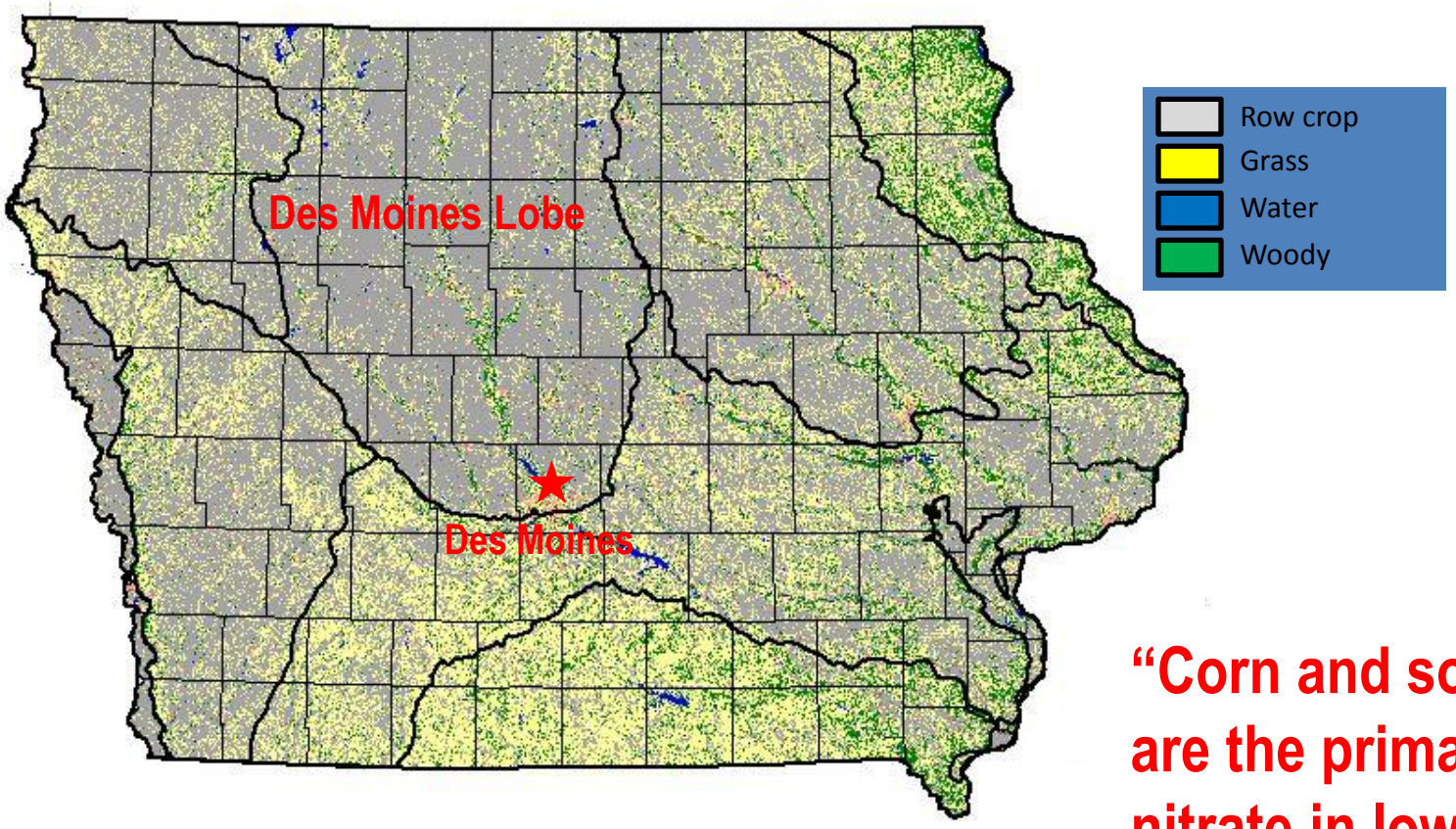
Agriculture Myth:
The Family Farm that "Feeds the World"

- Approximately 90,000 Iowa farms
- Nearly 90% of Iowa's food is imported

Industrial Agriculture Reality: Highly Capital Intensive, Federally Subsidized Business

$1.3 Billion in USDA Payments (second only to Texas)

The Major Driver of Surface Water Quality in Iowa

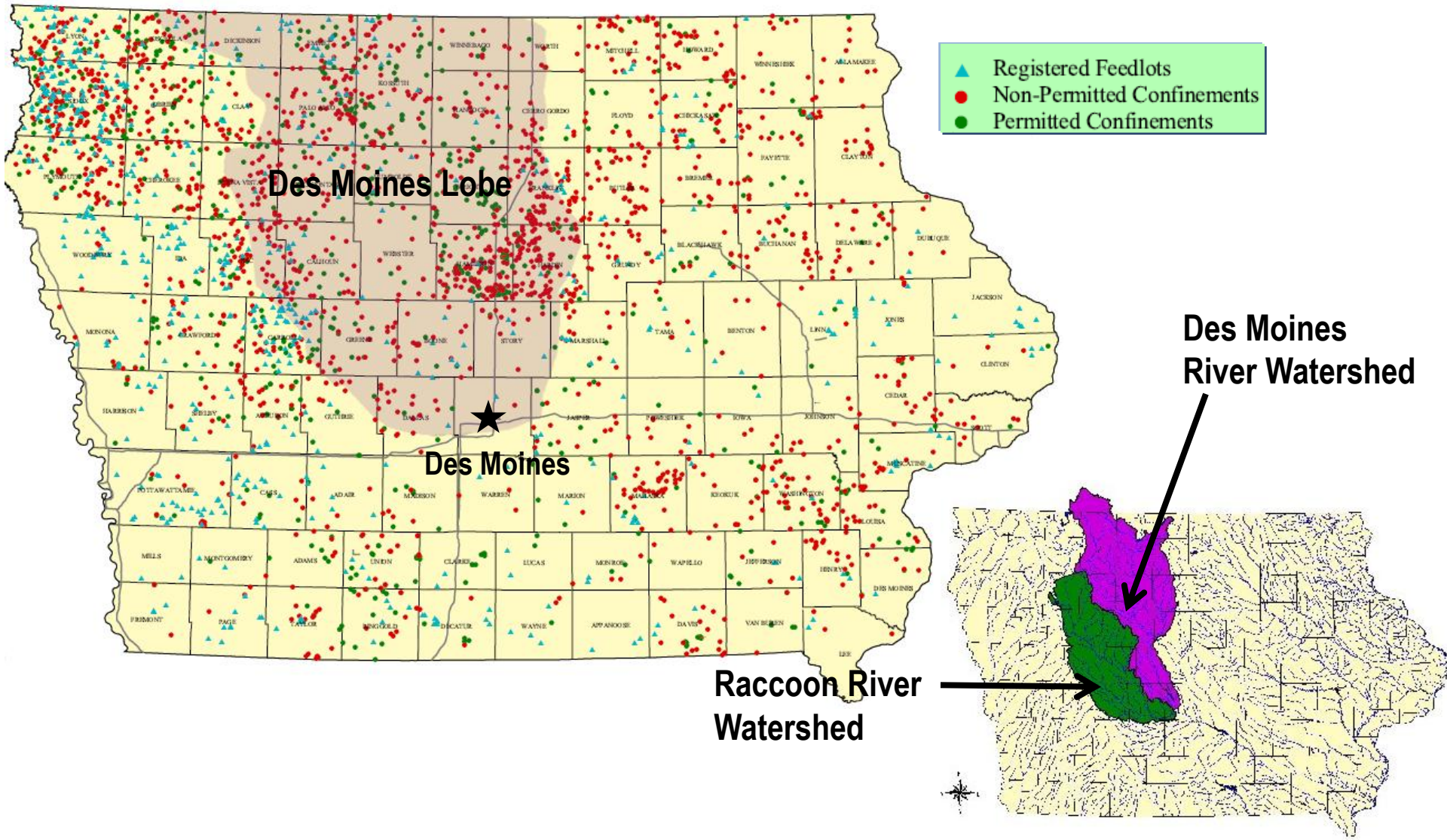


Approximately 10,000 square miles upstream

"Corn and soybean fields are the primary cause of nitrate in Iowa waterways."

Michael Castellano and Matthew Helmers, Iowa State University
The Des Moines Register, April 12, 2015

The Major Driver of Surface Water Quality in Iowa



Top Pollutant Concerns in Source Water

- **Nutrients:** nitrates, phosphorus, ammonia
- Microbial Contaminants: bacteria, protozoa, and viruses
- Spills
- Total Organic Carbon
- Trichloroethylene (TCE)
- Total Trihalomethanes (TTHM)
- Emerging Contaminants: pharmaceuticals and personal care products, and hexavalent chromium

Gulf of Mexico Dead Zone at 5 Year Average:

Nutrient Reduction Strategy

Nitrates (NO3) in Water

- EPA Safe Drinking Water Standard: **10 mg/L**.
- Nitrate levels above the standard are a **public health** risk. Particularly at risk are infants below six months of age who, if left untreated, could become seriously ill or die.
- Nitrate treatment not addressed through traditional lime softening/filtration system. Side-stream treatment is required.

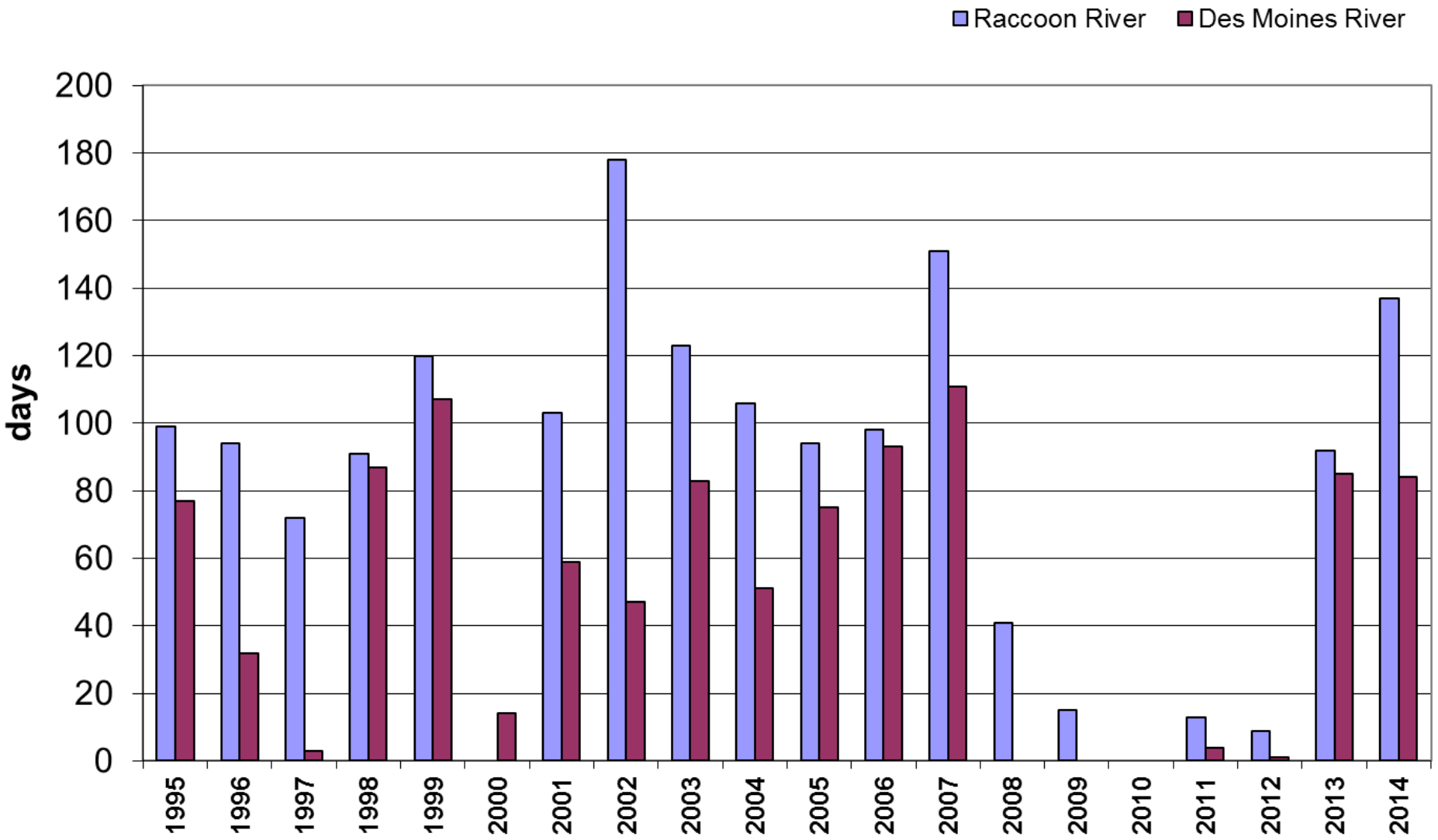
Iowa Nutrient Reduction Strategy: Iowa Public Policy Approach

- *Sources not currently regulated account for 92% of the total nitrogen

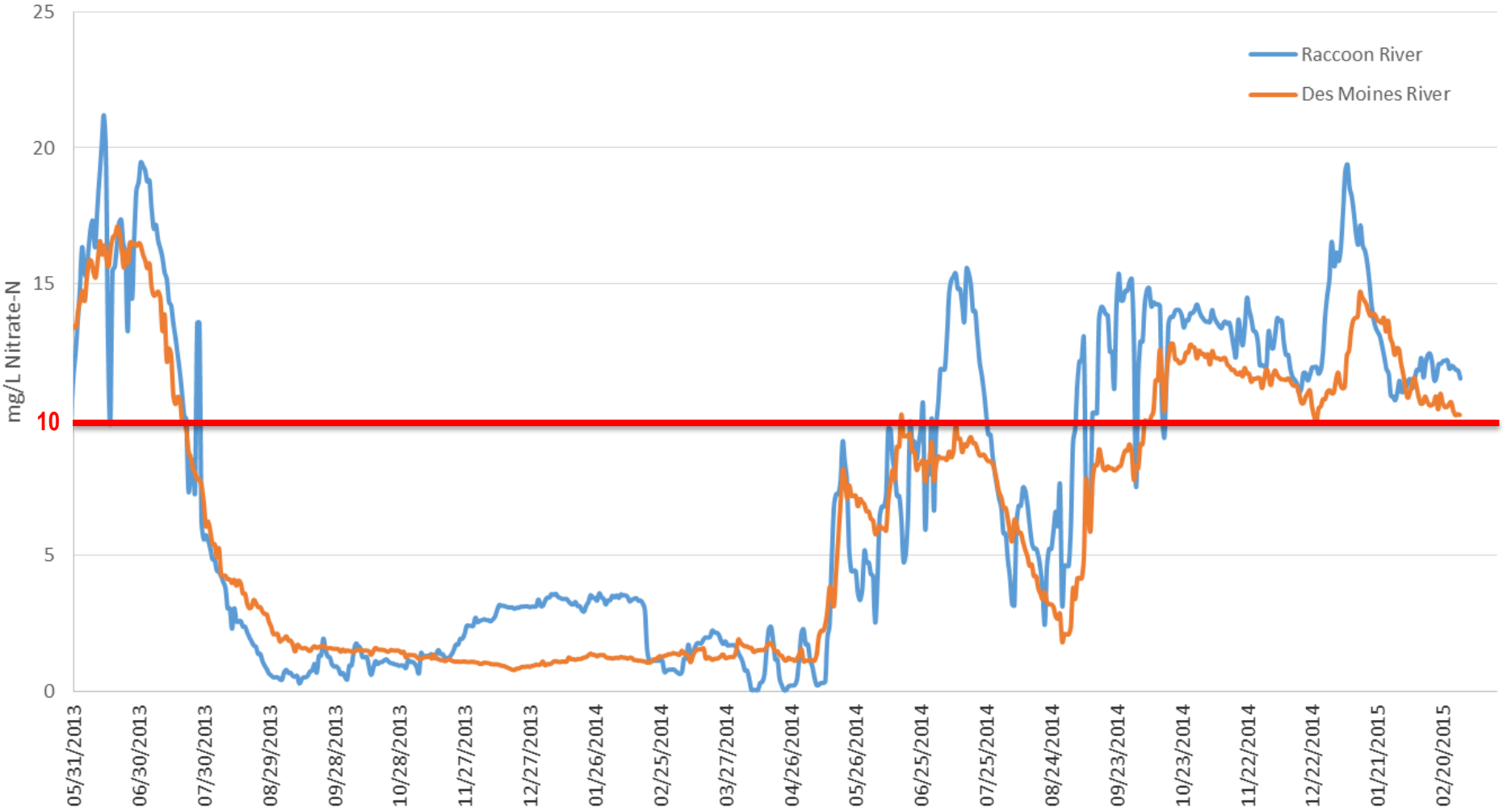
  * Nutrient Reduction Strategy incorrectly labels these as “non-point sources”

- Reduce nutrient pollutants by 45%
  - No timelines
  - No commitments to measurement or metrics
  - No resource commitments to voluntarism
- Regulate 10% of nutrient contributors and pursue voluntarism (non-regulation) of 90%

Number of Days Above the 10 mg/L Nitrate Safe Drinking Water Standard



Since Nutrient Reduction Strategy Implemented… This Trend Will Not Change By Voluntary Measures



Denitrification Costs

Additional cost to meet EPA drinking water standard

2013 Costs

Treatment Cost	$722,500
Lost Revenue	$186,200
Total 2013 Expense	**$908,700**

2014-2015 Costs

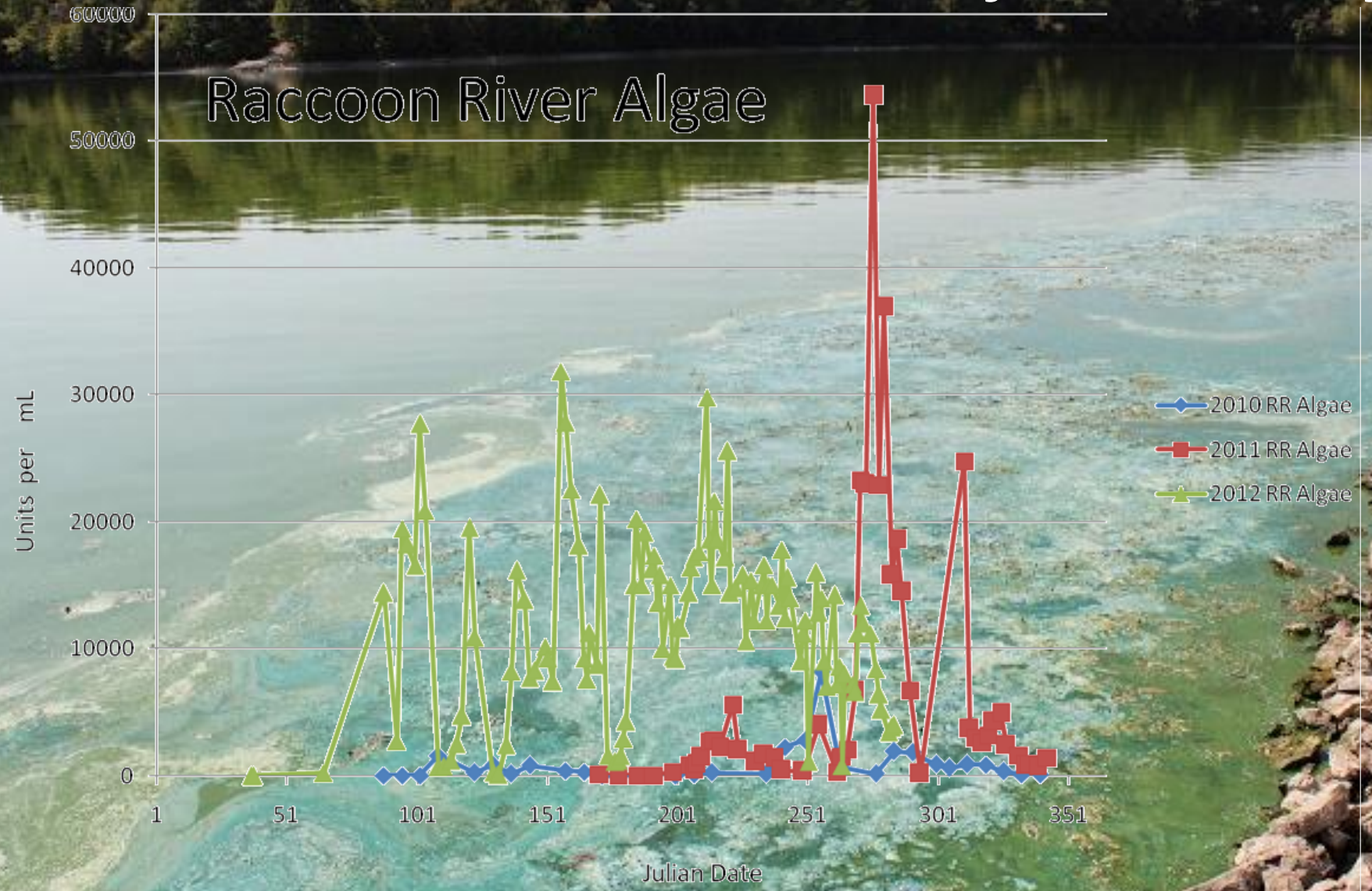
Treatment Cost	$540,000
Total 14-15 Expense	**$540,000**

Estimated Cost for New Denitrification Facility

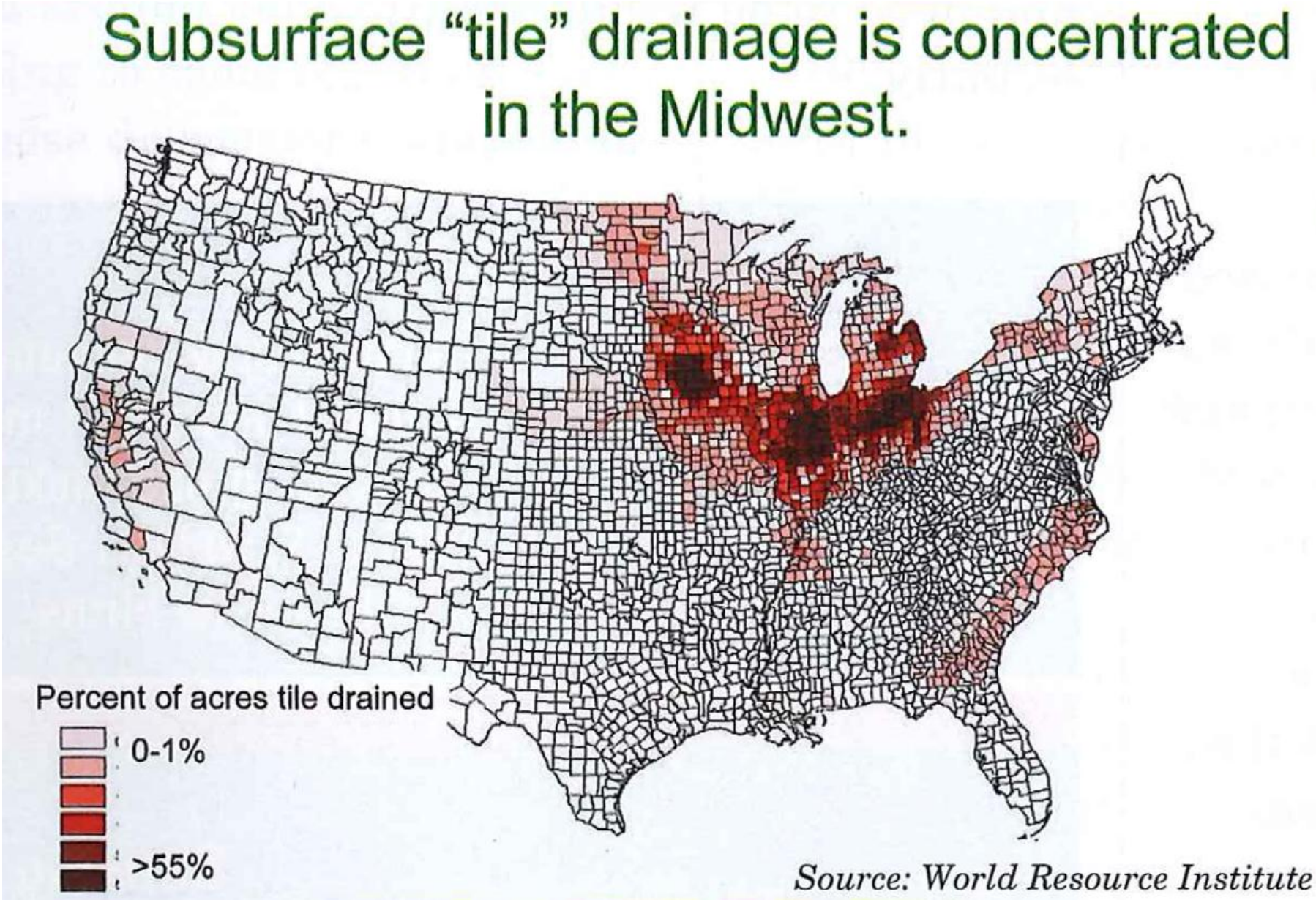
$76 million – $183 million

Paid for by DMWW ratepayers

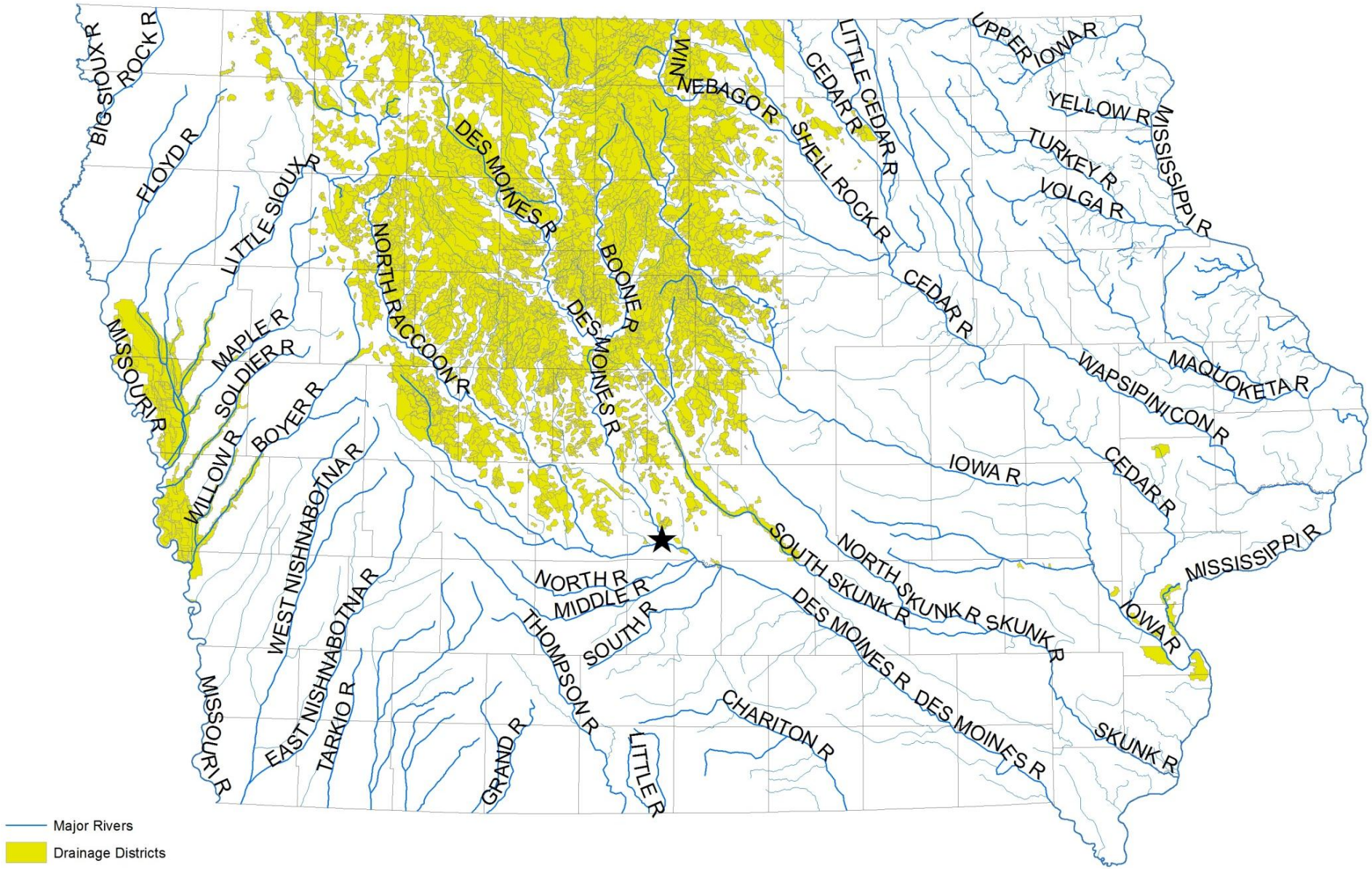
Lesson of Summer of 2012: Quality not Quantity



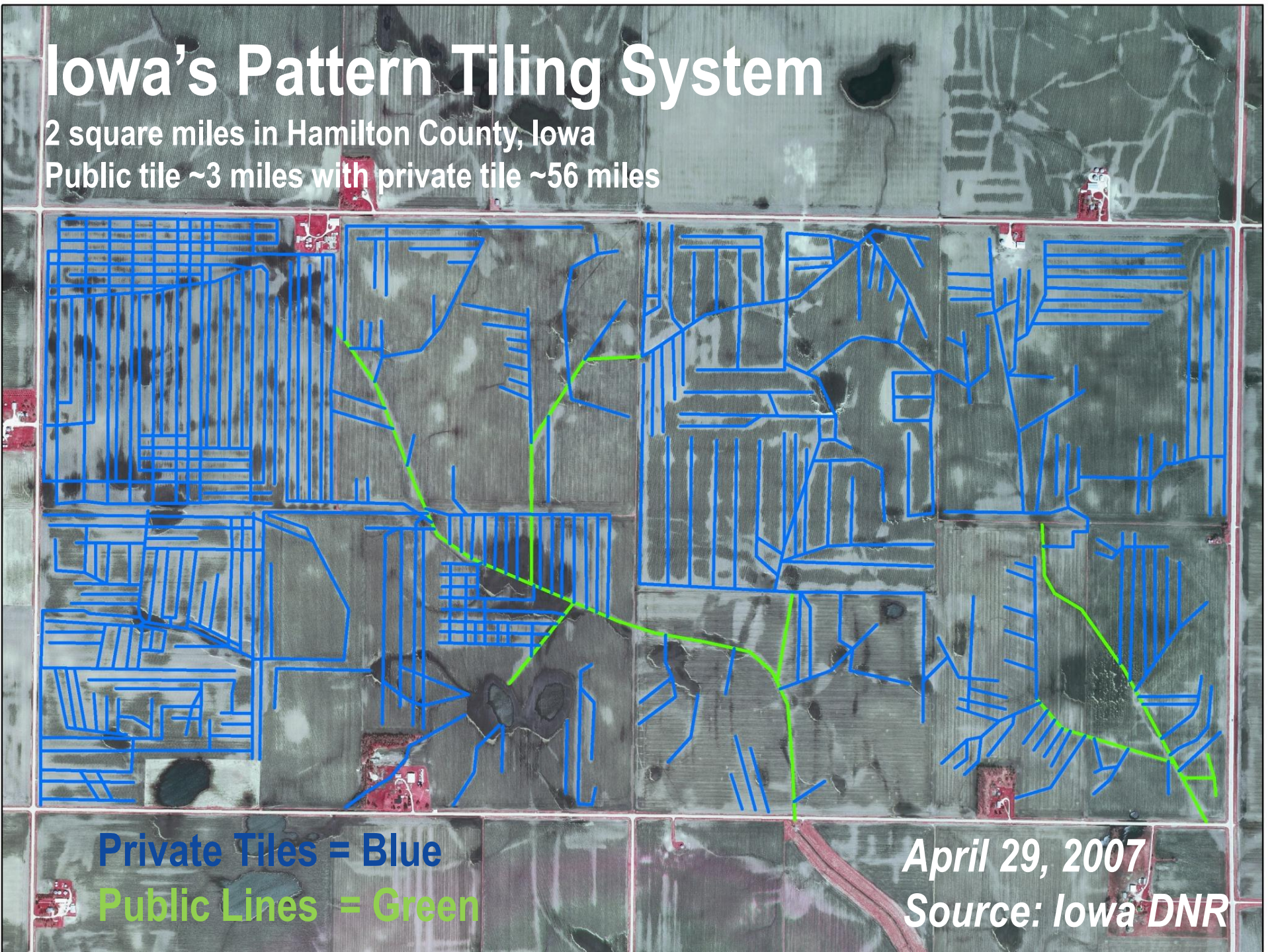
Tile Drainage Concentration



Iowa Drainage Districts




Drainage Tiling:
Increasing Water
Quantity while
Reducing Water
Quality
Regulate to treat at
the point of
discharge of outlet


Iowa's Pattern Tiling System
2 square miles in Hamilton County, Iowa
Public tile ~3 miles with private tile ~56 miles
Private Tiles = Blue
Public Lines = Green
April 29, 2007
Source: Iowa DNR


No other business besides agriculture
can run a pipe without regulation
to the Waters of the State
Sac County, Iowa

Point Source or Non-point Source: Can You See the Difference?

Wastewater Treatment Plant Discharge

Point source
Regulated
Treated discharge
Permitted (with discharge limits)
Potential contaminants discharged
Nitrates
Microbial
Pharmaceuticals
Location is mapped

Should one be regulated while the other is unregulated?

Agricultural Tile Drainage

Non-regulated
Non-treated discharge
Non-permitted (no discharge limits)
Potential contaminants discharged
Nitrates
Microbial
Pharmaceuticals
Location is un-mapped
(commonly)

Conservation Practices

“There is no single strategy to effectively reduce nitrate loss. Individual farms will require different combinations of nitrate strategies...All the scenarios require high levels of implementation of a wide variety of methods…All landowners in Iowa will need to engage in nutrient reduction strategies if we are to reach our water quality goals.”

Michael Castellano and Matthew Helmers, Iowa State University
The Des Moines Register, April 12, 2015

Bioreactors

Saturated Buffer Strips

“The land might be yours, but the water belongs to all of us.”

Governor Mark Dayton (D-MN)

Impending "Tragedy of the *Unregulated* Commons?"

- Iowa's water use is based on riparian water rights which are derived from the ownership of land adjacent to a river or stream. That owner has the right to reasonable use of the water which the land is adjacent to, so long as that reasonable use does not harm another's use.
- "Water occurring in a basin or watercourse …is public water and public wealth of the people of the state … The control and development and use of water for all beneficial purposes is vested in the state."

  -- Iowa Code 455B.262 (3)

Regulation Protects Community Interests

- **Pharmaceuticals** → Patient Safety
- **Restaurants** → Patron/Public Safety
- **Air Traffic** → Travelers/Commerce Safety
- **Traffic Laws** → Motorist Safety
- **Air Quality** → Human and Wildlife Safety
- **Water Quality** → Heavily regulated in urban environment, but voluntarily "regulated" in agriculture

Has voluntary environmental protection worked?

DDT… Lead in gasoline … Phosphorus in detergents

Des Moines Water Works
Commitment to the Community

Invest in Infrastructure + **Improve Technologies** + **Advocate for Clean Water**

=

Regulate to Protect Source Waters

Safe, Affordable and Abundant Water You Can Trust for Life

clean water is for life

Des Moines Water Works

Water You Can Trust for Life

www.dmww.com | | dsmh2o.com

Customer Service: (515) 283-8700 | 24/7 Emergency: (515) 283-8772

Bill Stowe, CEO & General Manager

stowe@dmww.com | (515) 283-8721 | (515) 202-8298